

REMARKS

Reconsideration of the application in view of the above amendments and the following remarks is respectfully requested.

I. Status of the Claims

Claims 1-10 are withdrawn from further consideration, as being drawn to a provisionally non-elected invention. Claims 11-14, 17-19, 21, and 22 have been amended. Claim 16 is cancelled without prejudice or disclaimer to the subject matter recited therein. No new matter is added. Claims 1-15, and 17-23 are pending.

II. Restriction Requirement

The Examiner has imposed a Restriction Requirement, requiring the election of one of the following two groups:

Group I: Claims 1-10, which are drawn to a method of growing a nitride semiconductor layer; or

Group II: Claims 11-23, which are drawn to a nitride semiconductor light emitting device.

The Examiner imposed the restriction requirement orally during a telephone call. In response, Applicants had made an oral election during a subsequent telephone call with the Examiner on October 11, 2007, provisionally electing Group II, claims 11-23, drawn to a nitride semiconductor light emitting device. Applicants confirm their previously made oral election, provisionally electing Group II, claims 11-23, drawn to a nitride semiconductor light emitting device, without traverse.

III. Objections

Portions of the Specification and claims 11, 12, 14, 16-19, and 22 are objected to for informalities. Specifically, typographical errors have created inconsistencies throughout the specification and the above claims. Applicants have amended the specification and claims 11, 12,

14, 16-19, and 22 to address these issues. Accordingly, Applicants respectfully request that the objections to the specification and claims 11, 12, 14, 16-19, and 22 be withdrawn.

IV. Rejections under 35 U.S.C. §103

Claims 11, 12, and 14-23 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,455,870 to Wang et al. (“Wang”) in view of U.S. Patent No. 6,955,933 to Bour et al. (“Bour”). The Examiner asserts that the combination of the references discloses each and every feature of the claimed invention. Applicants respectfully disagree.

Amended independent claim 11 recites a nitride semiconductor light emitting device comprising a single quantum well layer:

being made of In-rich InGaN resulting from the lattice mismatch with the top layer of $Al_xGa_yIn_{1-x-y}N$ ($0 \leq x \leq 1$, $0 < y \leq 1$, $0 < x+y \leq 1$) layer and Ga in the In-rich InGaN being mainly supplied from the top layer of $Al_xGa_yIn_{1-x-y}N$ ($0 \leq x \leq 1$, $0 < y \leq 1$, $0 < x+y \leq 1$) layer...wherein the single quantum well layer comprises a first compositional grading region with In content increasing between the top layer of $Al_xGa_yIn_{1-x-y}N$ ($0 \leq x \leq 1$, $0 < y \leq 1$, $0 < x+y \leq 1$) and the In-rich region, and a second compositional grading region with In content decreasing between the In-rich region and the additional nitride semiconductor layer.

The references, alone or in combination, do not suggest or disclose these features.

Wang describes a light emitting device constructed of multiple superlattices. The device described in Wang includes a substrate, a buffer layer, at least one active layer, and superlattice layers which are made up of quantum well and barrier layers. The quantum well layers of Wang are *epitaxially* grown onto the substrate (emphasis added). *See* Wang, col. 4, lines 34-39. It is known in the art that a layer deposited via epitaxial growth maintains the same crystal structure as the substrate onto which it is deposited

In contrast, the presently claimed invention is directed to a semiconductor light emitting device with a quantum well layer “resulting from the lattice mismatch with the top layer of $Al_xGa_yIn_{1-x-y}N$,” as recited in amended independent claim 11. The quantum well layer is grown

through a process such as metalorganic chemical vapor deposition (MOCVD), resulting in a lattice mismatch between the grown quantum well layer and the layer upon which it is grown. *See* U.S. Patent Publication No. 2007/0075307, ¶[0032]. Bour does not cure this deficiency of Wang.

Further, the Examiner concedes that Wang does not disclose a quantum well layer having “a first compositional grading region with In content increasing between the top layer...and the In-rich region, a second compositional grading region with In content decreasing between the In-rich region and the additional nitride semiconductor layer,” and attempts to cure this deficiency with Bour. Applicants respectfully submit that Bour does not cure this deficiency of Wang.

Bour describes a light emitting diode made up of a first semiconductor layer, an active region which is formed from a second semiconductor layer, and a third semiconductor layer. The active region is formed from a plurality of quantum well layers and at least one barrier layer. The composition of each of the quantum well layers is graded, but no single quantum well layer has multiple composition gradings. *See* Bour, col. 4, lines 9-14.

In contrast, amended claim 11 recites a single quantum well layer having a first composition grading and a second composition grading. The first composition grading region has “In content increasing between the top layer of $Al_xGa_yIn_{1-x-y}N$ ($0 \leq x \leq 1$, $0 < y \leq 1$, $0 < x+y \leq 1$) and the In-rich region,” and the second compositional grading region has “In content decreasing between the In-rich region and the additional nitride semiconductor layer.” Although Bour describes multiple quantum well layers that each have a composition grading, Bour does not disclose a single quantum well layer having more than 1 composition grading.

Accordingly, for at least the reasons discussed above, Applicants respectfully request that the rejection of claim 11 be withdrawn.

Claims 12 and 14-23 depend from claim 11. Accordingly, for at least the reasons discussed above, Applicants respectfully request that the rejection of claims 12 and 14-23 be withdrawn.

Claim 13 is rejected under 35 U.S.C. §103(a) as being unpatentable over Wang in view of Bour, and further in view of *Effect of Growth Interruption on In-rich InGaN/GaN Single Quantum Well Structures*, 20 October 2003, pp 2831-2833 by Kwon et al. (“Kwon”).

Kwon does not cure the deficiencies of Wang and Bour.

Accordingly, for at least the reasons discussed above, Applicants respectfully request that the rejection of claim 13 be withdrawn.

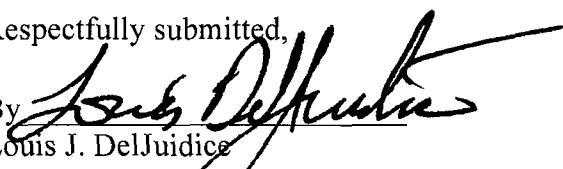
CONCLUSION

Each and every point raised in the Office Action mailed October 18, 2007, has been addressed on the basis of the above remarks. In view of the foregoing it is believed that all the claims are in condition for allowance and it is respectfully requested that the application be reconsidered and that all pending claims be allowed and the case passed to issue.

If there are any other issues remaining which the Examiner believes could be resolved through a Supplemental Response or an Examiner's Amendment, the Examiner is respectfully requested to contact the undersigned at the telephone number indicated below. view of the above amendment, applicant believes the pending application is in condition for allowance.

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Respectfully submitted,

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